

Open Babel 2002



Welcome
& Vision Statement



Welcome

- 1st Open Babel Meeting
 - 1 full day
 - San Francisco
- 19 “registered” participants
 - 5 DOE LABS: {A, LA, LB, LL, S}NL
 - 4 Universities: Utah, IU, SJSU, ODU
 - 11 contributed agenda items
 - 9 reported medium-to-high interest in contributing Babel extensions



Thanks to our Sponsors

- Rob Armstrong, Sandia
- Donna Blevins, Sandia

Thanks to Also To

- Craig Rasmussen, LANL

The header features a textured, light-colored background. A horizontal bar, composed of a solid orange segment on the left and a textured, multi-colored segment on the right, spans the width of the slide.

Why We Are All Here

- Establish Babel Developer Community
- Transition Babel to a new phase in its life-cycle



New phase in Babel's life-cycle

- For previous 3.5 years of Babel
 - 2 Modes of Babel Use:
 - Library Wrappers: wrote SIDL files and used Babel to wrap their libraries
 - Library Users: used Babel generated bindings, but need not be aware of Babel
 - Babel itself was gray-box. (Source code, but no built-in support for extensions)
- Now
 - 9 report medium-high interest in creating Babel extensions



Establish Babel Developer Community

- We will get to every contributed agenda item today
- But we also need to agree on "Community Practices"
 - What is Core Babel?
 - What is a Babel extension?
 - How should Core Babel support extensions?
 - How are extensions promoted to Core Babel?



Agenda

- Vision - Gary Kurfert
- Process - Tom Epperly
- Discussion (& Consensus?)

Break

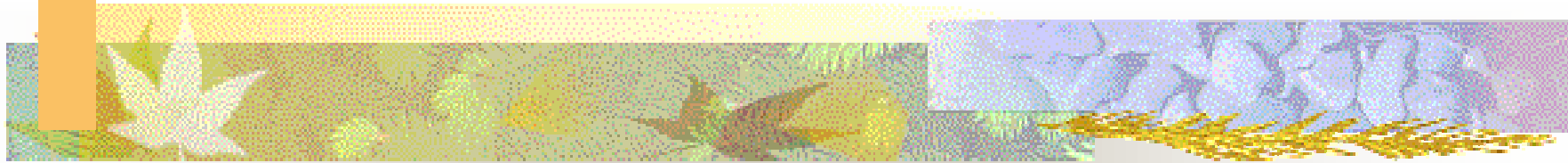
- Extensions: Babel API Explained,
- Lunch

- Contributed Agenda Items:
RMI, F90, C++, Efficiency

Break

- Prioritizing for the Future
- Open Babel '03?

The Open Babel Vision





**We are thrilled that so
many talented folks want
to contribute to Babel!**



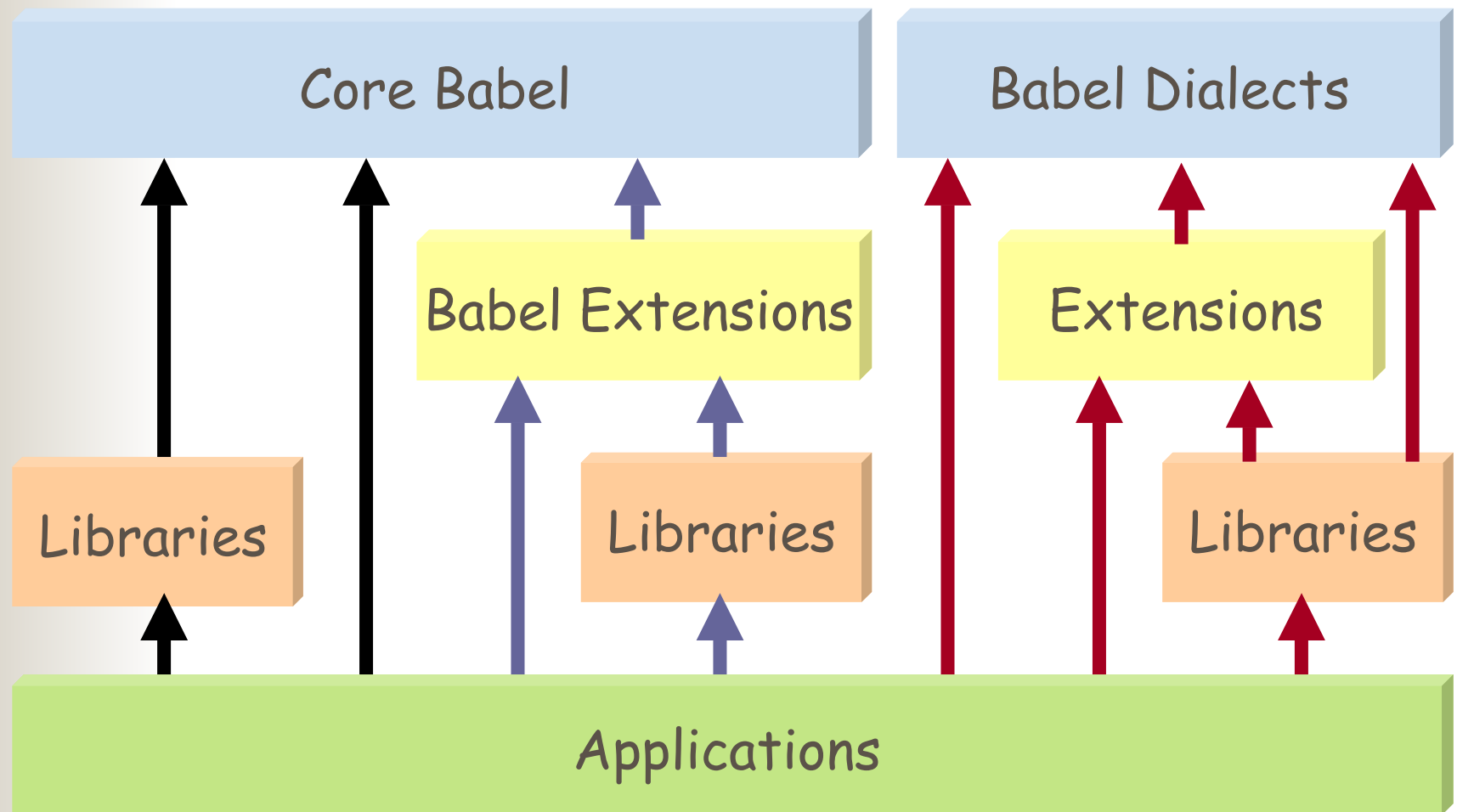
**We are committed
to Open Source:
the Best Strategy for
Babel & Community**



Focus: Enhancing our Open Source Methodology

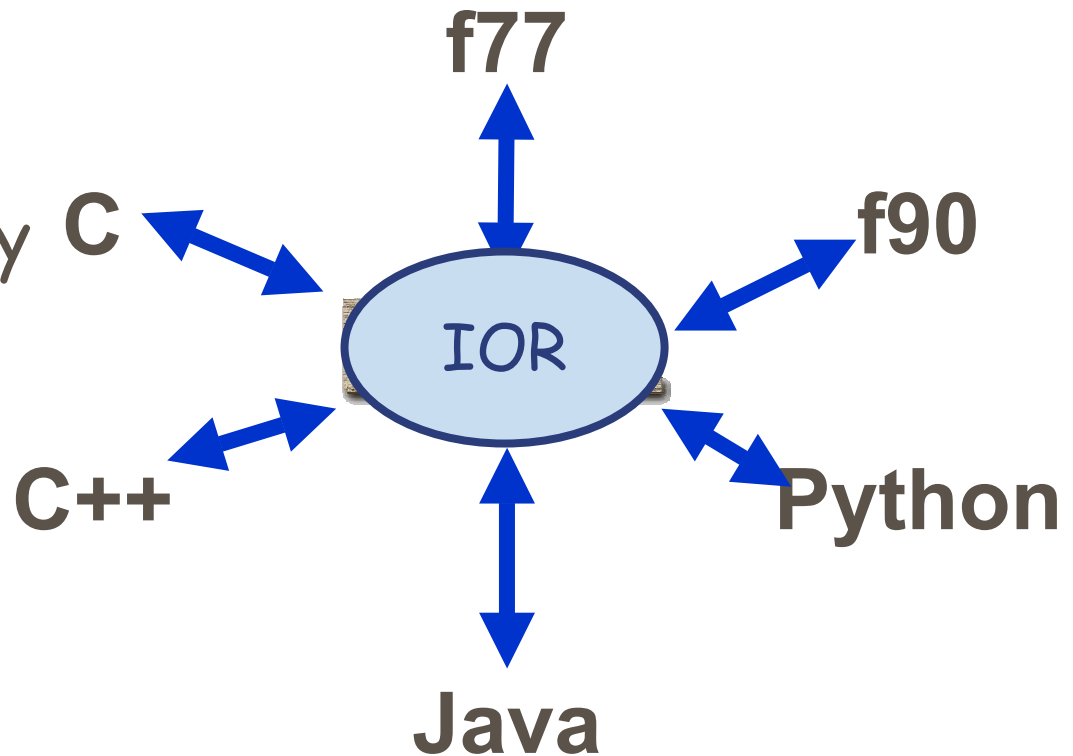
- Open Source Licensing is necessary, but not sufficient
 - Babel has been OSI Certified™ Open Source since 0.7.0 (5/7/2002)
- Additional necessities
 - Supporting a vibrant developer community
 - Clear and consistent vision
 - Continuing growth in user base
 - Amenability to customization/extensions
 - Fair and transparent process for feeding good code back into Core Babel

The Open Babel Vision

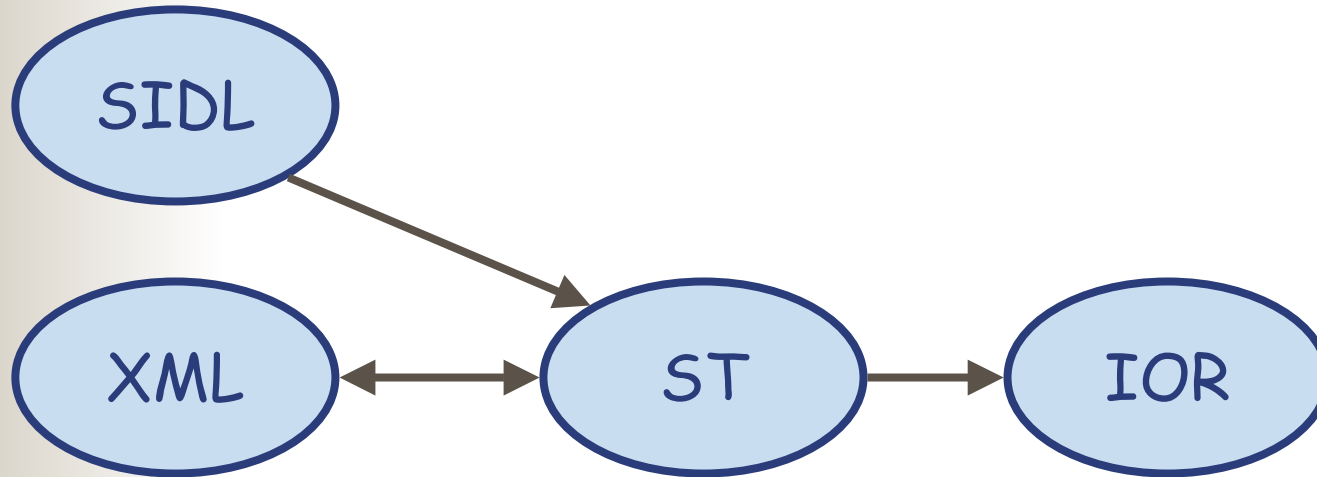


IOR Modifications Are New Dialects

- IOR is linchpin of language interoperability
- All calls go through IOR

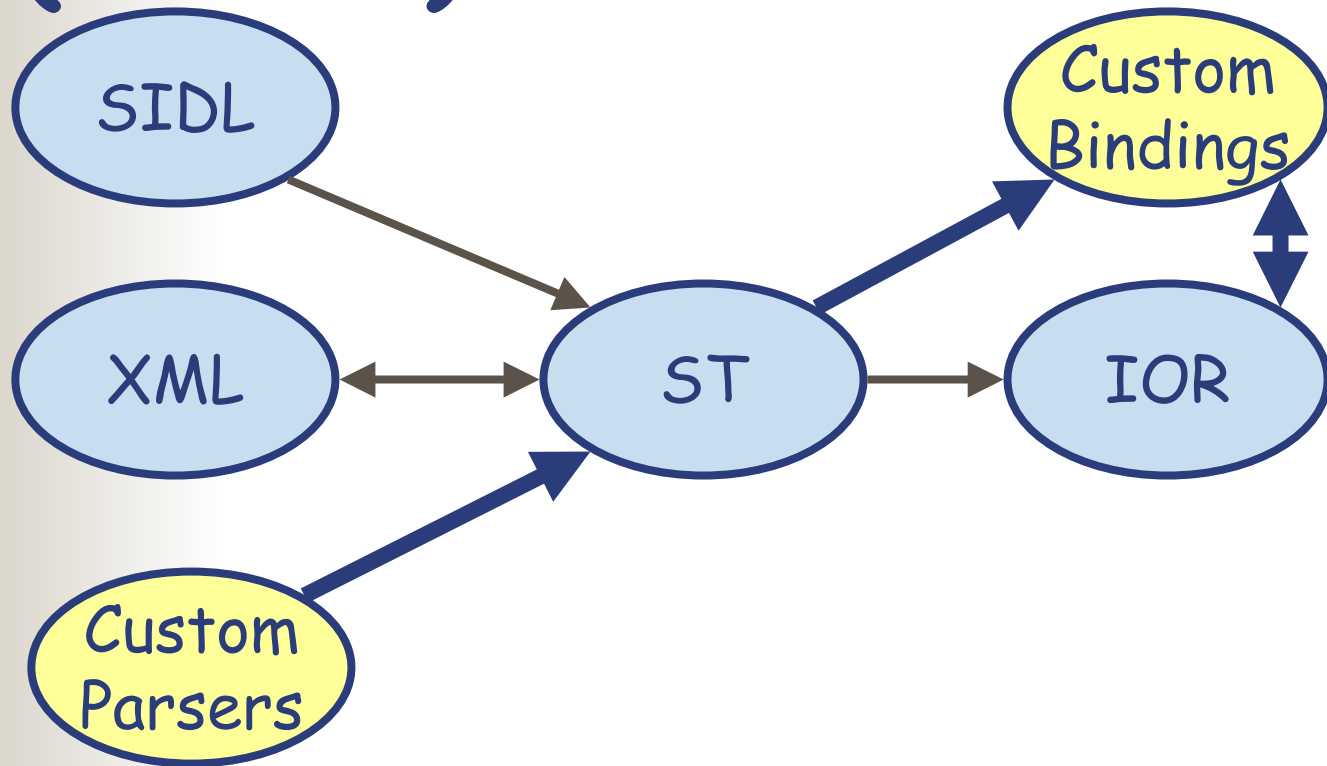


SIDL, XML or Symbol Table Mods Usu. Induce IOR Mods



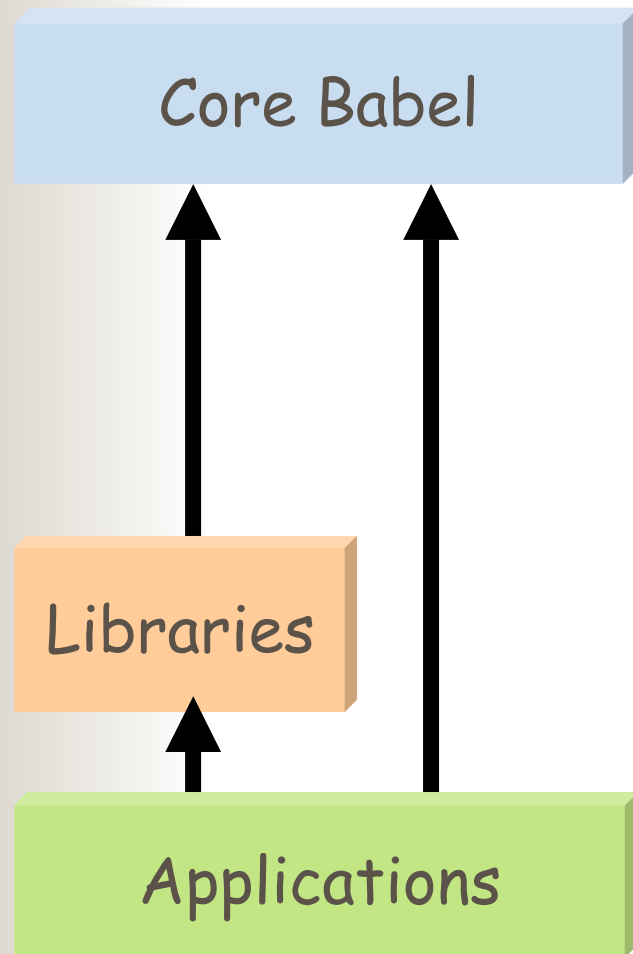
- Conceptually, the same information is encoded in all four ways.

Extensions Hook Into ST (& IOR) Without Modification



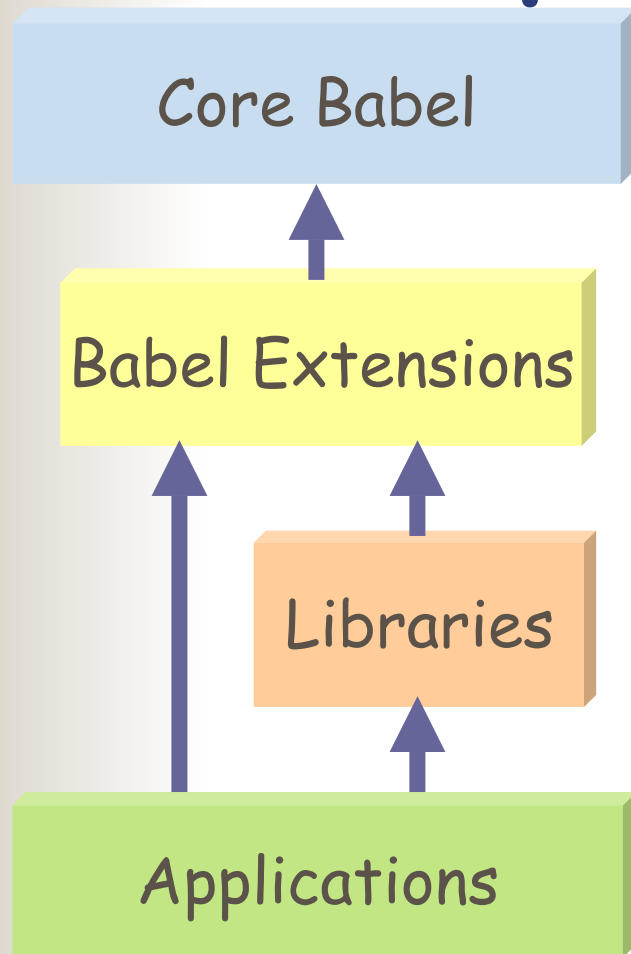
- Babel's own parsers and language bindings connect in exactly this way

Core Babel: Strongest Promise of Interoperability



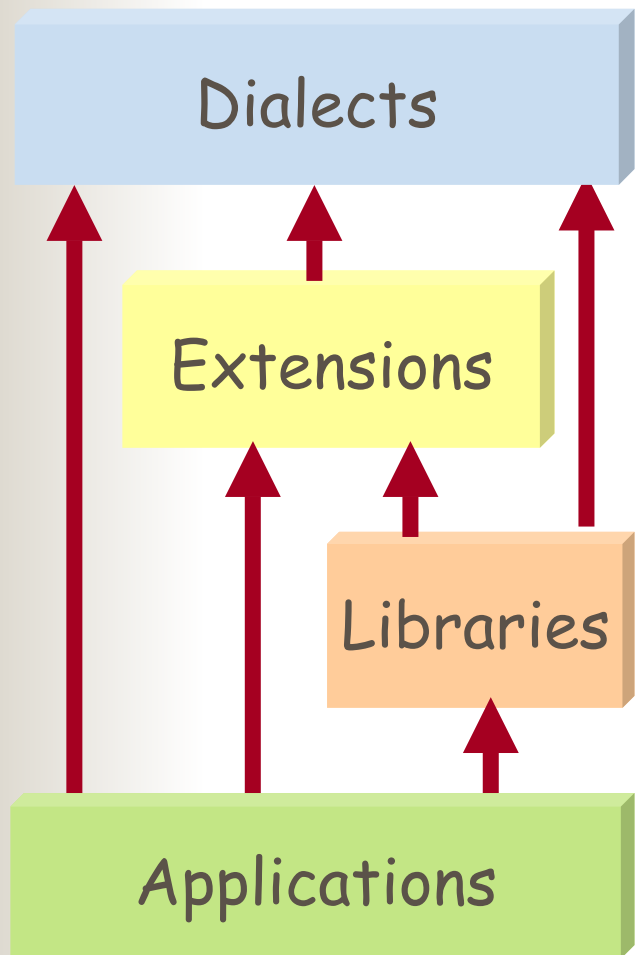
- Classic Modus Operandi
- Libraries are wrapped in Babel
- Applications call libraries through Babel

Babel Extensions: New Area For Independent R&D



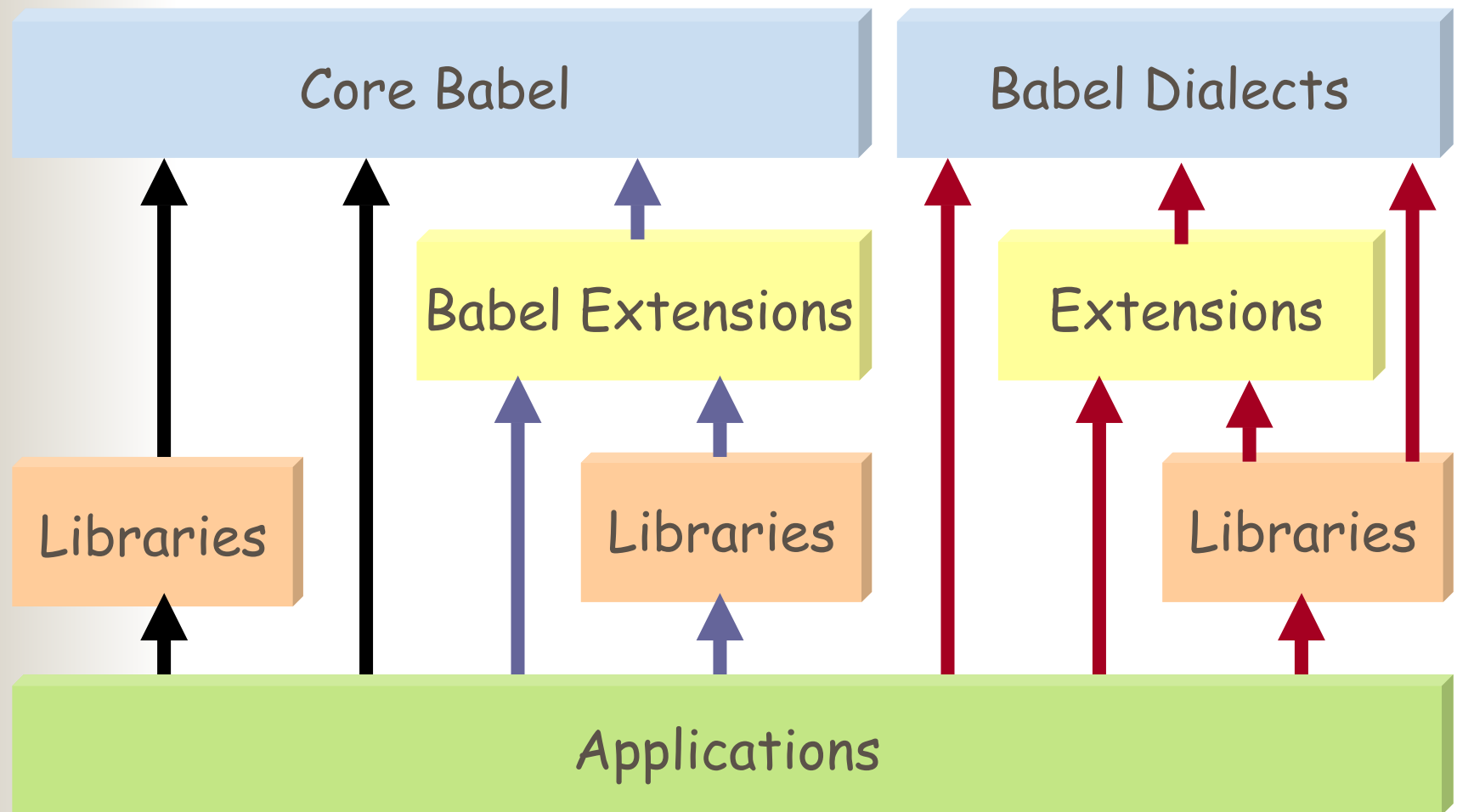
- Extensions allow for 3rd party Plug-Ins to Babel
- May be candidates for future inclusion in Core Babel
- Interoperability depends on intent and quality of extension

Babel Dialects: Speculative R&D Without a Net

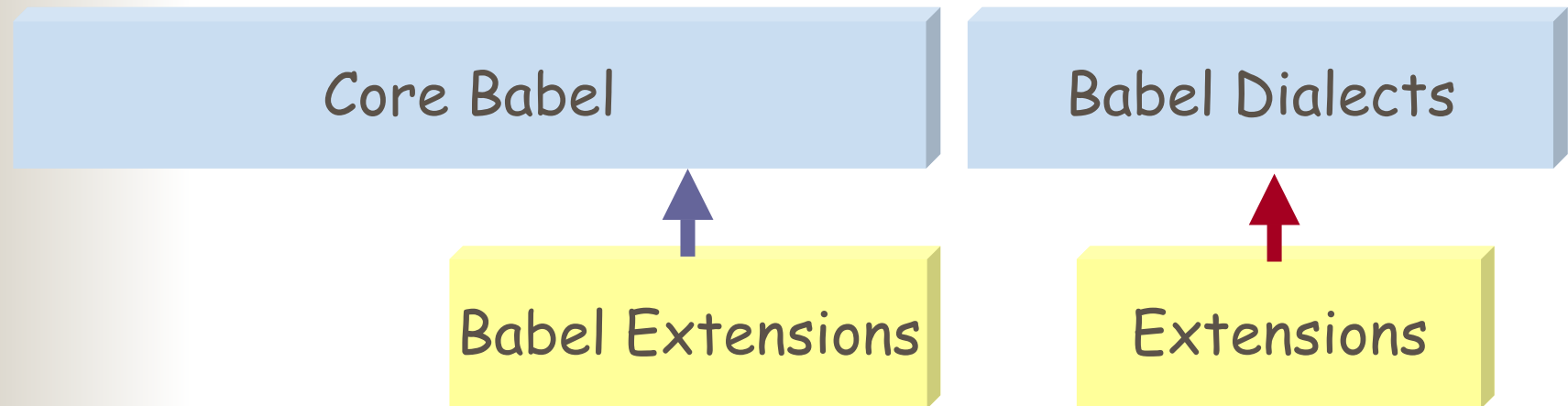


- **Warning: Voids Guarantee of Interoperability**
- Fertile area of research
 - Dialects that enable new opportunities for extension is particularly attractive
- Dialects are Code Forks
 - Harder for Dialect features to be integrated into Core Babel than for Extensions
 - Forks drift out of synch

The Open Babel Vision



Where Do You (as Developer) Participate?



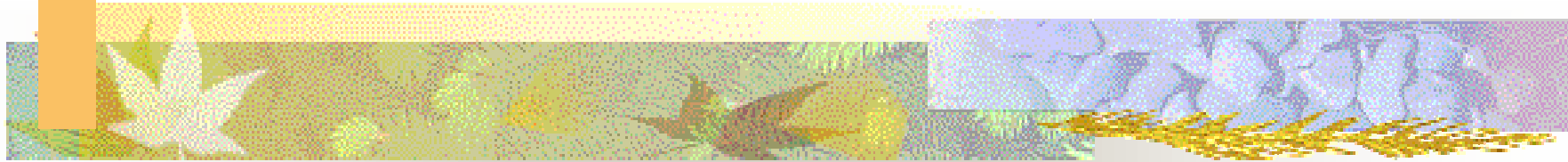
- Core Development is the most controlled
- Babel Extensions require using existing ST but leverage Core Babel
- Dialects high risk option,
 - harder to support long term
 - ones that add new hooks are of more interest



Keep In Mind When Getting into Technical Discussions

- This meeting is about empowering the community to co-develop Babel
- Lots of good ideas are outside the Core Babel Vision
 - Doesn't mean you shouldn't do it
 - Extensions are easier to keep synchronized with Babel evolution
- Emphasize hooks you need to do your own extensions
 - Maximize extensibility to support community

Process for Including New Things Into Core Babel



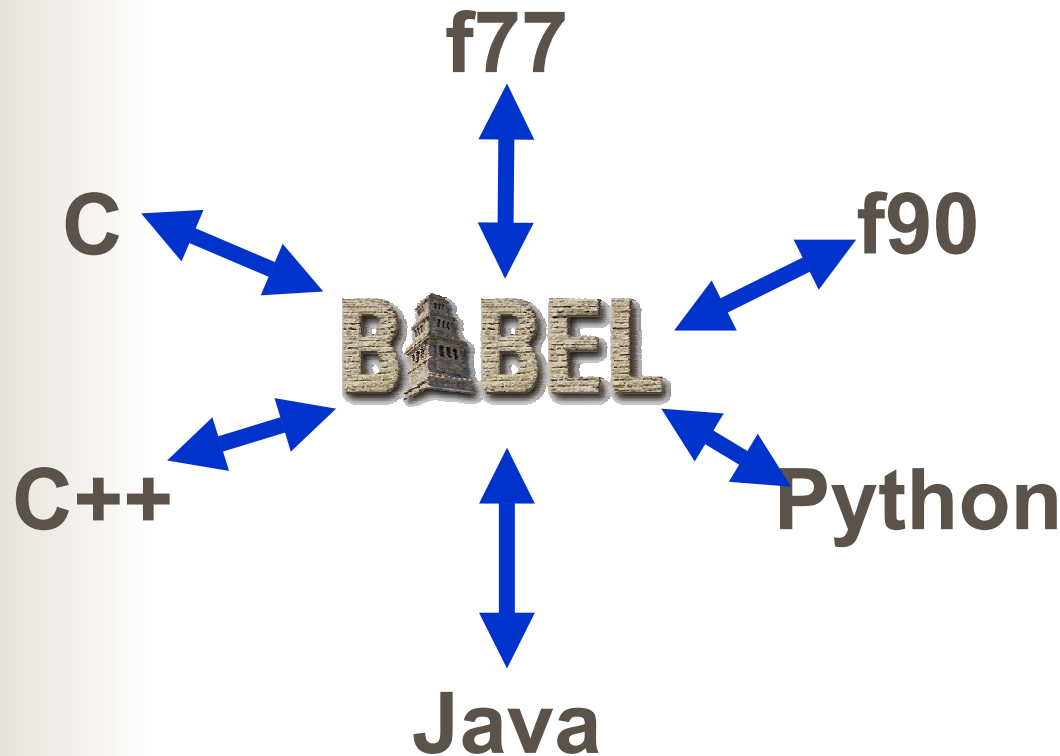
Does it fit within
the Core Babel Vision?



Core Babel Vision

- Babel = Interoperability
- SIDL
 - is language and platform independent
 - describes a unified OOP model
- Intuitive Language Bindings
- High Performance
- 10% inspiration, 90% perspiration

Babel = Interoperability



- All calls go through IOR
- Caller doesn't know what language callee is



SIDL is Language & Platform Independent

- Every feature of SIDL must be implementable in all Babel languages.
- Language-specific details pollute the grammar & the model
- No automatic wrapping technology
 - This is important too, just outside the scope of core Babel



SIDL describes a unified OOP model

- We don't hide SIDL's OO nature in non-OO languages.
 - There is some interest, but not a core Babel goal



Intuitive Language Bindings

- For each language: What would an experienced programmer in that language expect?
 - C expects `char*`
 - C++ expects `std::string`



High Performance

- Babel is targeted for HPC applications
 - Emphasis on HPC languages
- Emphasis on in-process interoperability
 - current C++ bindings were designed to avoid C++ virtual dispatch in addition to the compulsory IOR dispatch.



10% inspiration

90% perspiration

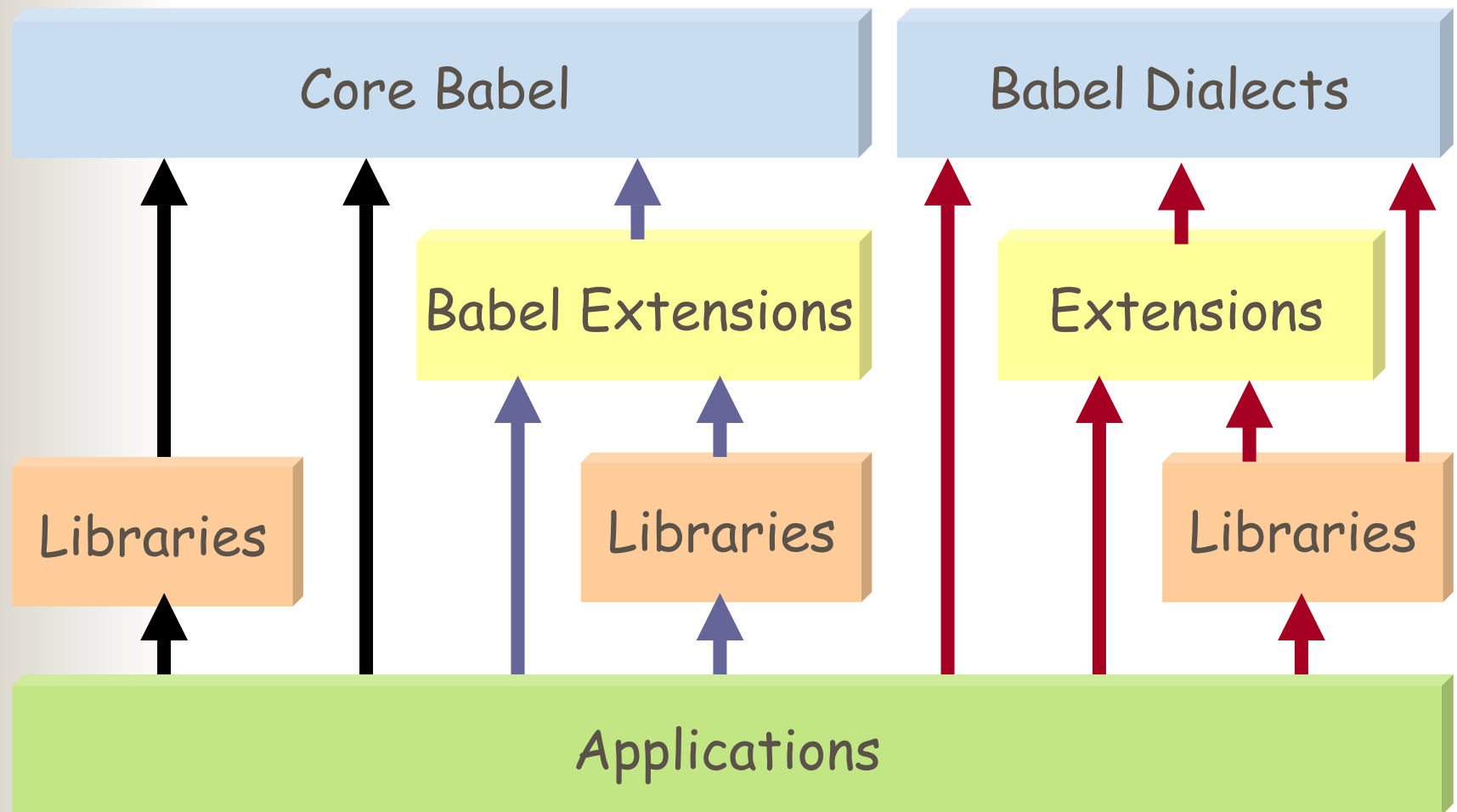
- Transitioning code from research quality to production quality is 90% of the work.
- Babel has always done both, simultaneously
 - currently run 9500 test cases/ platform
 - advertise platform support only after
`./configure; make all check install` works
- Con: slower & harder
- Pro: Customers can trust Babel... almost as much as they trust their compiler.



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The Open Babel Vision





UCRL-VG-???????

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